

Remarks

Reconsideration and reversal of the rejections expressed in the Office Action of July 13, 2004 are respectfully contended in view of the following remarks and the application as amended. The present invention relates to a method for forming an FSG film.

Claims 12, 13, 30, 31, 46 and 47 were objected to due to formalities noted in the Office Action. However, the noted terms are defined at page 11 of the present specification. No new matter has been added. Claim 4 has also been canceled by this Amendment and Response.

Claims 1-17, 20-31, 33-35, 38-47 and 49-51 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Zhang et al., U.S. Patent No. 6,468,927, and Barnes et al., U.S. Patent No. 6,521,546. The Office Action states, inter alia, that while Zhang et al. do not disclose that the substrate structure is composed of silicon, that it nonetheless would have been obvious to combine the teachings of Zhang et al. and Barnes et al. to enable the substrate formation step of Zhang et al. to be performed according to the teachings of Barnes et al., because one of ordinary skill in the art would have been motivated to look to alternative methods of performing the disclosed substrate formation step of Zhang et al.

Zhang et al. disclose gap-fill and damascene methods for depositing an insulating thin film of nitrofluorinated silicate glass on a substrate in a process chamber. A high-density plasma, generated from a gaseous mixture of silicon-, fluorine-, oxygen-, and nitrogen-containing gases, deposits a layer of nitrofluorinated silicate glass onto the substrate.

Barnes et al. relates to a method of forming an integrated circuit using a fluoro-organosilicate layer. The fluoro-organosilicate layer is formed by applying an electric field to a gas mixture comprising a fluoro-organosilane compound and an oxidizing gas. The fluoro-organosilicate layer is compatible with integrated circuit fabrication processes. In one integrated circuit fabrication process, the fluoro-organosilicate layer is used as a hardmask. In another integrated circuit fabrication process, the fluoro-organosilicate layer is incorporated into a damascene structure.

Applicants respectfully contend that there is no teaching, suggestion or incentive supporting the combination of the Zhang et al. and Barnes et al. patents. The Zhang et al. patent, while disclosing a method of depositing a nitrogen-doped FSG layer, does so in the context of depositing a layer of nitrofluorinated silicate glass onto the substrate. Thus, it is apparent that

there is no teaching, suggestion or motivation in this reference to employ the divergent teachings of Barnes et al., which applies an electric field to its gas mixture in a deposition chamber to form a fluoro-organosilicate layer on the substrate. Therefore, there is no teaching, suggestion or incentive supporting the combination of the patents to produce the claimed invention, and prima facie obviousness is not established.

Claims 18, 19, 36, 37, 52 and 53 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Zhang et al. and Barnes et al., and further in view of Lee et al. This rejection is overcome based on the previous discussion.

For all of the above reasons, it is respectfully contended that the solicited claims define patentable subject matter. Reconsideration and reversal of the rejections expressed in the Office Action of July 13, 2004 are respectfully submitted. The Examiner is invited to call the undersigned if any questions arise during the course of reconsideration of this matter.

Respectfully submitted,

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